

**REMARKS**

Applicant has amended Fig. 1 to include the legend "Prior Art" and therefore, this objection has been addressed and overcome by Applicant and should be withdrawn.

A new title has been supplied in this amendment and the paragraph on page 21 has been amended to refer to Figure 8C and 9B instead of 9C and 10B. Thus, these objections have been overcome and should be withdrawn. The other comments noted by the Examiner have been addressed and likewise overcome.

Claims 1 and 37 stand rejected under 35 U.S.C. 112, first paragraph. Applicant has amended claim 1 to address this issue by reciting that the substrate and sidewalls represent an injection moldable article.

Applicant respectfully disagrees with the Examiner's comments concerning the weight to be given to certain features that are present in claim 1. More particularly, claim 1 recites an injection molded article formed from an injection molded polymeric material. These limitations go directly to the characteristics of the product itself since it obviously forecloses that the claimed device is an article formed of a metal material and that the sidewalls are separate members attached using other techniques, such as welding or adhesives. These features describe characteristics of the end, final product as opposed to be process type steps that are commonly found in method type claims. Applicant respectfully requests the Examiner to reconsider and withdraw the current conclusions since the features recited in claim 1 are clearly proper for presentation in a product type claim and do serve to limit or narrow the scope of the product itself.

Further, the Examiner contends that even if the injection molded characteristics that are recited in claim 1 were given weight, that a reference, namely the Parce et al., reference discloses an injection molded microfluidic device. After carefully reviewing the Parce et al. reference, Applicant notes that the "injection molding" passage that the Examiner is referring to is merely a very simple cursory mention of injection molding in a large list of manufacturing techniques. There is absolutely no enabling disclosure as to how to use an injection molding process to form a

microfluidic device that has the dimensions of the present microfluidic device as outlined in the present specification.

Moreover, there is an important difference between the microfluidic devices disclosed in the prior art, including the Parce et al. reference. Namely, that the Parce et al. disclosed architectures are conventional flat 2-D microfluidic devices. The method for making these devices is cleanroom microfabrication techniques and the mold for any injection molding manufacture of the Parce devices is still derived from the silicon technology. In other words, only conventional 2-D structures are disclosed where the channel is recessed channel that is formed in the substrate itself. In direct contrast and as is clearly recited in amended claim 1, the present invention is directed to macroscopic 3-D structures that represent structures that are simply not possible to make with silicon technology. More particularly, the 3-D structures disclosed in the present application and set forth in amended claim 1 and shown in Figs. 8C and 9B are ones with raised channel architecture - namely, where the channel floor is coplanar with the top surface of the substrate. In these arrangement and in direct contrast to the recessed channel architecture, the channel is not simply a groove or recessed that can be easily formed in the substrate by providing a negative impression. Instead, the present invention is directed to raised wall structures where the channel walls extend outwardly from the planar top surface of the substrate with the channel floor being formed between the sidewalls and being coplanar with and in fact, being one in the same as the top surface of the substrate.

Applicant has amended claim 1 to further set forth these features by stating that the raised walls and substrate are formed *in situ* in a common mold such that the raised walls are integrally formed and extend outwardly from the substrate. In other words, the recited structure is a "raised channel" architecture which is opposite the recessed architectures disclosed in Parce et al. and the other references.

In sum, Applicant has amended claim 1 to recite an injection molded article that has integral raised sidewalls that are formed *in-situ* in a common mold with the substrate from which the channel floor and top surface of the substrate are co-planar. The features recited in claim 1

serve to limit and narrow the scope of the claimed product and directly speak about physical characteristics of the claimed device and in particular, the claimed relationship between the side walls and substrate and therefore, these features are to be given full weight in assessing the patentability of the present invention. Applicant requests entry of the above amendments. No new matter is being introduced as support is found in the specification beginning at page 26.

None of the references recited by the Examiner, when taken alone or in combination, either discloses or suggests all of the features set forth in amended claim 1. For example, Zanzucchi does not disclose an injection molded, polymeric article that has a raised channel architecture. The other references, including Fuchs et al. and Sundberg, likewise suffer from this same deficiency and therefore, fail to cure the deficiencies of the present invention. These references merely show the recessed type channel construction formed by etching, etc., the substrate.

Applicant respectfully requests reconsideration and allowance of amended claim 1 based on the foregoing comments.

In discussing and rejecting claims 21-23, the Examiner combines the Parce et al. reference with the Jedrzejewski et al. Claim 21 recites a structure similar to the one found in Figure 8C, while claim 22 recites a structure that is found in Figure 9B. Applicant respectfully submits that the Jedrzejewski et al. reference does not show or suggest such structures. In particular, the Examiner refers to Fig. 6(I) of the Jedrzejewski et al. reference; however, this Figure merely shows pillars formed on a substrate (base) 290 with fluid passages formed through the pillars. A cover slip 291 with apertures is placed over the fluid passages so that gas may flow through the fluid passages and then exit through openings formed at the top of the apertures in the cover slip. Applicant is unsure as to what the Examiner is calling a cover protrusion in this reference since the reference only speaks of apertures being formed in the cover slip. In any event, if the structure formed between the two shown apertures in the cover slip is equated as being the protrusion, this reference clearly does not disclose the claimed arrangement since this protrusion of the cover slip does not provide a channel ceiling that encloses and seals off the channel.

More specifically, in both claims 21 and 22, the protrusion of the cover serves to seal the channel off by providing a channel ceiling that is opposite the channel floor. None of the "protrusions" that are formed as part of the prior art covers accomplish or perform this function. In the present invention, the cover protrusion is intimately placed either between inner surfaces of the sidewalls (claim 21) to seal the channel or a pair of protrusions are placed in intimate contact with the outer surfaces of the raised sidewalls to seal the channel by providing a channel ceiling. In the Jedrzejewski et al. reference, the passageway (channel) formed in the pillars are simply not enclosed by the cover due to the cover providing a channel ceiling by mating with the raised sidewalls.

Based on the foregoing, reconsideration and allowance of these claims are in order.

Claims 2-4, 9-18, 20-23, 25-27, 29-30, and 38-39 should be allowed as depending from what should be an allowed independent claim 1, as amended.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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## **AMENDMENTS TO THE DRAWINGS**

The attached sheet of drawings includes changes to Fig. 1.

This sheet replaces the original sheet including Fig. 1.